



IFW

Docket No.: 0171-1294PUS1
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Masayuki MORITA et al.

Application No.: 10/588,232

Confirmation No.: N/A

Filed: August 3, 2006

Art Unit: N/A

For: ELECTRODE FOR ENERGY STORAGE DEVICE
AND PROCESS FOR PRODUCING THE SAME

Examiner: Not Yet Assigned

**LETTER SUBMITTING THE INTERNATIONAL REPORT ON PATENTABILITY AND
REFERENCE CITED ON INTERNATIONAL SEARCH REPORT**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

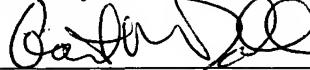
Subsequent to the filing of the above-identified application on August 3, 2006, **attached hereto** is an English translation of 1) International Preliminary Report on Patentability (Form PCT/IB/338 and 373) and 2) the Written Opinion of the International Searching Authority (Form PCT/ISA/237) that should be made of record in the present application. The PTO is requested to make these documents of record in the file of the present application and to return the initialed Form PTO-SB08 to the undersigned. Furthermore, **Applicants enclose herewith** a copy of the English abstract of MUKAI (Dai 44 Kai Battery Symposium in Japan, November 4, 2003, pages 672-673) which was cited on the International Search Report. Applicants note from a review of PAIR that the International Bureau failed to forward a copy of MUKAI to the PTO as is required when a PCT application enters the national phase under 371.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or to credit any overpayment to Deposit Account No. 02-2448 for any

additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Dated: November 3, 2006

Respectfully submitted,

By  #43575
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Attachments: 1) English translation of International Preliminary Report on Patentability (Form PCT/IB/338 and 373)
2) English translation of the Written Opinion of the International Searching Authority (Form PCT/ISA/237)
3) English abstract of MUKAI (Dai 44 Kai Battery Symposium in Japan, November 4, 2003, pages 672-673)

PATENT COOPERATION TREATY

PCT/JP2005/001388

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF TRANSMITTAL
OF COPIES OF TRANSLATION
OF THE INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY
(CHAPTER I OR CHAPTER II)
OF THE PATENT COOPERATION TREATY)
(PCT Rules 44bis.3(c) and 72.2)

To:

KOJIMA, Takashi
Ginza Ohtsuka Bldg. 2F.
16-12, Ginza 2-chome
Chuo-ku, Tokyo 1040061
JAPON



Date of mailing (day/month/year)
28 September 2006 (28.09.2006)

Applicant's or agent's file reference
FAP-4069

IMPORTANT NOTIFICATION

International application No.
PCT/JP2005/001388

International filing date (day/month/year)
01 February 2005 (01.02.2005)

Applicant

YAMAGUCHI UNIVERSITY et al

1. Transmittal of the translation to the applicant.

- The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter I).
- The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter II).

2. Transmittal of the copy of the translation to the designated or elected Offices.

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following designated or elected Offices requiring such translation:

None

The following designated or elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

AE, AG, AL, AM, AP, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EA, EC, EE, EG, EP, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OA, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

3. Reminder regarding translation into (one of) the official language(s) of the elected Office(s).

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability (Chapter II).

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned within the applicable time limit (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Authorized officer

Masashi Honda

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference FAP-4069	FOR FURTHER ACTION		See item 4 below
International application No. PCT/JP2005/001388	International filing date (<i>day/month/year</i>) 01 February 2005 (01.02.2005)	Priority date (<i>day/month/year</i>) 06 February 2004 (06.02.2004)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant YAMAGUCHI UNIVERSITY			

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

Date of issuance of this report 19 September 2006 (19.09.2006)

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer
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Facsimile No. +41 22 338 82 70	Masashi Honda
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e-mail: pt08@wipo.int	
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PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

PCT
TRANSLATION

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

			Date of mailing (day/month/year)
Applicant's or agent's file reference FAP-4069		FOR FURTHER ACTION See paragraph 2 below	
International application No. PCT/JP2005/001388	International filing date (day/month/year) 01.02.2005	Priority date (day/month/year) 06.02.2004	
International Patent Classification (IPC) or both national classification and IPC			
Applicant YAMAGUCHI UNIVERSITY			

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/JP	Authorized officer
Facsimile No.	Telephone No.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/JP2005/001388

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
 a sequence listing
 table(s) related to the sequence listing
 - b. format of material
 in written format
 in computer readable form
 - c. time of filing/furnishing
 contained in the international application as filed.
 filed together with the international application in computer readable form.
 furnished subsequently to this Authority for the purposes of search.
3. In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2005/001388

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims <u>1-29</u>	YES
	Claims _____	NO
Inventive step (IS)	Claims <u>1-29</u>	YES
	Claims _____	NO
Industrial applicability (IA)	Claims <u>1-29</u>	YES
	Claims _____	NO

2. Citations and explanations:

Claims 1-29

The inventions of claims 1-29 are neither described in any of the documents cited in the ISR nor obvious to a party skilled in the art.

アミノキサリソニン類の電解重合と そのキャパシタ電極特性

(山口大工、日産化学工業株式会社) ○前井義晃、吉本信子、森田昌行、古性均、
近間祐己、笠井幹生、大土井啓祐*

Electro-Polymerization of Aminoquinolinines and Their Characteristics as Electrochemical Capacitors

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The electrochemical polymerization of aminoquinolinines(AQX) and the electrochemical properties of resulting polymers have been investigated. The polymerization was performed in *N,N*-dimethylformamide(DMF) containing AQX under acidic conditions. The polymerization behavior depended on the chemical structure of AQX. The polymerized AQX with biphenyl substituent showed high redox activity not only in aqueous acid but also in non-aqueous acetonitrile solutions. The redox activity of the polymer was examined as the electrode material for electrochemical capacitors.

1. 装置

AQX類の電気化学的性質には電気的、光学的及び電気化学的に興味深い性質を持つものが多く、材料科学の分野できまざまな提案がなされている。アミノキサリソニン類(図1)は、分子内に電子供与部位と電子吸引部位が隣接して存在するため電子的に特異な運動を示す。本研究では、この化合物の溶液重合化を、電解酸化による重合を用いて行い、さらに得られた重合物の電気化学的挙動並びに電気化学キャバシタ特性について調査した。

2. 実験方法

アミノキサリソニン(AQX)類の電解重合は、試験板基板に白金の電極を使用してPAA上にメッシュ状、参考極にAg/Ag⁺を用いて、定電位法または電位掃引法により行った。HClまたはHClO₄を少量添加したDMF溶液にAQXを溶解したものを電解液に使用した。生成した膜のキャラクタリゼーションは、MASS, XRDを用いた。重合物の電気化学的レドックス挙動の測定と充放電性能は、0.1 M H₂SO₄水溶液中で行った。得られた膜のセトニトリル(0.1 M TEAP)水溶液中で行つた。

3. 結果及び考察

電気化学的重合の反応性は置換基 R₁, R₂ の種類により異なった。その中でも、R₁=R₂=C₆H₅を有する AQX は酸性 DMF 電解液中、約 0.9 V vs. Ag/Ag⁺ 以上の電位で酸化重合し、電極上に黒色の膜を形成した。

重合膜は、非水系(AN)電解液中、水系(0.1 M H₂SO₄)電解液中でレドックス応答が確認された。しかしながら、ITO 上に生成した重合膜は水系(H₂SO₄)電解液中では、測定中に膜が電極基板から剥離してしまった。

Fig. 2 に R₁=R₂=C₆H₅の AQX から重合した膜の 0.1 M H₂SO₄水溶液中でのサイクリックボルタグラムを示す。-0.1 V と +0.6 V 付近にレドックス応答が確認される。このレドックス応答はサイクルを繰り返すごとに大きくなつた。一方、1.0 V 以上の酸化電流はサイクルを重ねるごとに小さくなつた。これは、膜の開裂の際に用いた DMF が膜中に残存していたことと関係すると思われた。

Fig. 3 には R₁=R₂=C₆H₅の AQX から重合した膜の 0.1 M TEAP を含む AN 溶液中でのサイクリックボルタグラムを示す。全体としてのサイクル数よりも少し小さいが、+0.7~1.1 V および+0.2~0.3 V にそれぞれブロードな酸化・還元電流の応答が確認される。いずれの応答もサイクルを繰り返すごとに小さくなる傾向にあつた。これらの電流を用いて充放電を行い、電気化スープーキャパシタ特性についても検討を行つた。

Fig.1 Aminoquinolinine

Fig.2 Cyclic voltammogram for

poly(aminoquinolinine) on Pt plate

in AN containing 0.1 M TEAP.

Fig.3 Cyclic voltammogram for

poly(aminoquinolinine) on Pt plate

in AN containing 0.1 M TEAP.

Fig. 2 の結果によれば、共重合膜においても疎水性である R₁, R₂ を有する AQX における重合度はあまり高くならないことがわかつたので、アニリンとの共重合を行ない重合度の高い膜を得る試みを行つた。得られた膜のレドックス応答を利用してバベシタ特性については当日報告する。

第44回電池討論会 講演要旨集

日時 平成15年11月4日(火)・5日(水)・6日(木)
会場 リーガロイヤルホテル堺

(〒590-0985 堺市戎島町4-45-1)

《討論主題》

1. 電池の反応機構
2. 新しい電池材料
3. 高出力電池
4. 燃料電池の新展開

《国際セッション》

International Session on Fuel Cells,
Batteries and Capacitors for Vehicles

主催 (社)電気化学会 電池技術委員会

協賛 (財)大阪科学技術センター
(社)電気化学会 SOFC研究会
(社)電気化学会関西支部
(社)電気化学会燃料電池研究会
(社)日本化学会
(財)日本自動車研究所
燃料電池開発情報センター

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第4回電池討論会 講演要旨集

平成15年10月16日 印刷
平成15年11月4日 発行

編集実行責任者

(社)電気化学会電池技術委員会
第4回電池討論会実行委員長 沢倉千秋
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